

GUEST EDITORIAL

Bio-engineering and Bio-medical Technologies: Role in the Protection of the Protectors

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Every country is engaging its armed forces in different terrain and climatic conditions to protect sovereignty and manage internal conflict. During peace / war time conflicts, the soldiers are subjected to extreme environmental conditions. These extreme, hostile, non-habitable conditions exert a toll on the soldiers' performance and also pose threat to their life. Airmen are prone to be exposed to low pressures, high altitude, and hypoxic conditions. Similarly, a Mariner is exposed to high pressures and hydro environment. Land soldiers are deployed in various terrain having myriad environmental conditions such as high temperature in deserts, subzero cold conditions in the high mountains and varying range of difficulties encountered in forested hilly terrain. In addition to these adverse conditions, soldiers also need to counter the conflicts from neighbouring /enemy countries. It is paramount that, these soldiers are protected from all these adverse extreme environmental conditions.

To ensure soldiers carryout their mission, bio-engineering and aero-medical research focuses on developing tools, and systems to equip the soldiers to cope with the extreme and hostile environments. Bio-medical technology research facilitates development of preventive medicines and onsite / offsite treatment solution to medical issues and immediate relief to soldiers in the event of accidents/attacks. Research focus in the field of bio-engineering, bio-medical, aero-medical and under water technologies is growing year by year. The growth of the numbers of publications in these areas indicates the current requirement and future potential for research in this area.

Human engineering, study and prediction of injury level is one of the upcoming fields, wherein the modern software tools are used to evaluate the injury risk when humans are exposed to various high impacts without exposing humans to the real situation. Anthropomorphic test devices with bio-fidelity and simulation using the virtual anthropomorphic devices help in assessing the injury potential during war / war like scenario. The research in this area certainly provides vital information and generate data base which, in turn become a tool to quantify probable impact. This helps devise a plan for mitigation / prevention / safety preparedness for the protection of combatants.

Bio-medical Technology is an important area wherein, researchers are involved in the development of sensors used for medical application, physiological parameters monitoring devices, physical exposure measurement, nano-materials for medical application, bio-sorption etc..

In this issue of *Defence Life Science Journal*, a plethora of articles dealing with different areas of research in the field of bio-engineering, bio-medical, aero-medical and nano technologies are published. The articles published in this issue are related to on-board oxygen generation, injury analysis due to shock loads, bio-sorption, green synthesis of nano particles, sensing mechanism using Raman spectroscopy correlated with multivariate analysis, conscious level detection using EEG and simulated workloads, hemostatic aids, microneedle array dry electrodes.

The current focus area certainly leads to the evaluation / impact mitigation / protection of soldiers engaged in extreme environmental conditions negotiated in varying range of non-habitable terrain. This issue of DLSJ provides a good data base and information to scientific community and researchers in the bio-medical and bio-engineering field. The Guest Editor hopes that the researchers working in this area will immensely get benefitted from contributing their papers / research findings in this journal.

It is a great honour for the Guest Editor, who was entrusted with the job of editing this special issue on the bio-medical / bio engineering technologies which is the core area of work at Defence Bio-engineering and Electromedical Laboratory (DEBEL). The guest editor also acknowledges Dr.U.K.Singh, Outstanding Scientist & Director, DEBEL who has provided an opportunity to be a guest editor for this special issue on Bio-medical and Bio-engineering and his continued support all through the editorial process. It is also pertinent to appreciate the effort made by all the contributors of the research papers in this issue, and acknowledge the time and effort spared by the experts in reviewing the submitted articles.

The guest editor also wishes the scientific community all over the world get benefitted from the articles published in DLSJ and also earnestly requests them to publish their research findings in this fledgling journal to grow.